



National View of ESPC Use By State and Local Government

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Environmental Impact of Buildings

Americans spend up to 90% of their time indoors

Buildings:

- consume 40% of all energy
- add 40% to atmospheric emissions
- use 60% of all electricity and 25% of all water
- take up 35-40% municipal solid waste stream
- use of 25-30% of all wood and materials
- exploit significant amounts of land



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Lessening Economic and Environmental Impact

Energy Saving Actions (1990-2000)

- Energy Cost Savings – \$16.7 billion
- Electric Energy Savings – 166 million MWh
- Electric Demand Reductions – 2,500 MW
- Carbon Dioxide Emissions Reduction 217 Million Tons



Lessening Economic and Environmental Impact

Total Energy Saving Actions (1990-2020)

- \$95 billion in energy savings
- 981 MWh in electric energy savings
- 6,000 MW in electric demand reduction (15 new 400 MW power plants)
- 5.3 billion MMBTU reduction in direct fuel use
- Total savings power all California households for 13 years, and 4% of Kyoto Goals



Reduced Environmental Impact

Energy saving actions
mean reducing:

- 1.21 billion tons of CO₂
- 4.4 million tons of NO
- 7.2 million tons of SO₂
- 34.6 tons of mercury
- 57.6 tons of cadmium
- 3.2 tons of lead emissions
- 129,000 tons of particulates (PM10)

Equals planting 3.8 billion trees or
removing pollution of 250 million
mid-sized cars



Performance Contracting: A Short History

- State regulations separating procurement of financing, equipment and services once made performance contracting impossible
- Ohio House Bill 264
- PC Began primarily in the MUSH markets (municipalities, universities, schools and health care) in late 1970s, early 1980s
- 46 states have legislation or codes and all states permit performance contracting



Performance Contracting Facts

- \$3 billion industry in 2001 in U.S. and Canada
- Was \$500 million in 1992 – grown 6 times
- Hundreds of companies but most PCs are handled by less than 100 companies
- Typical PC costs in local government projects range from \$700,000 to \$1.4 million
- Energy consumption is typically reduced by 26 to 42%
- 50% of all PC projects documented to actually exceed savings



Key Drivers for Local Government PC

- Support public facilities
 - Fire stations
 - Libraries
 - Police stations
 - Arenas
- Upgrade waste water facilities
- Reduce costs and improve efficiency
- Positive public relations
- Safety / security of employees, visitors and physical assets
- Economic development
- Comply with EPA standards and healthy working environments
- Upgrade aging facilities



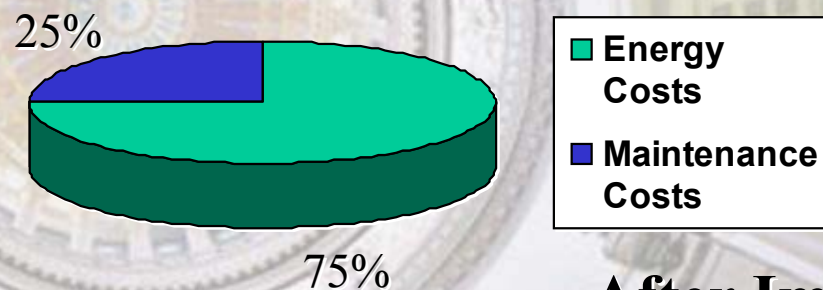
Benefits of Performance Contracting

- Provides better management and control of facility operations and costs
- Increases IEQ, reduces risk exposure and increases employee productivity
- Diverts utility cost to pay for needed capital facility improvements
- Preserves limited capital dollars
- Reduces repair and maintenance costs by replacing aging or obsolete equipment
- Enhances local economy
- Conserves energy resources

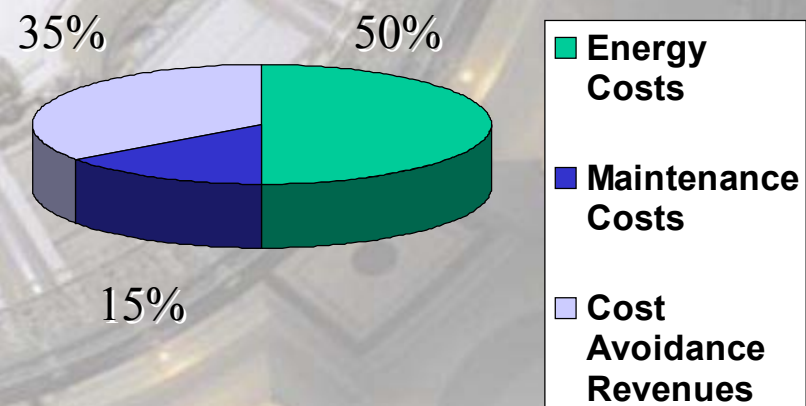


Cost Restructuring with PC

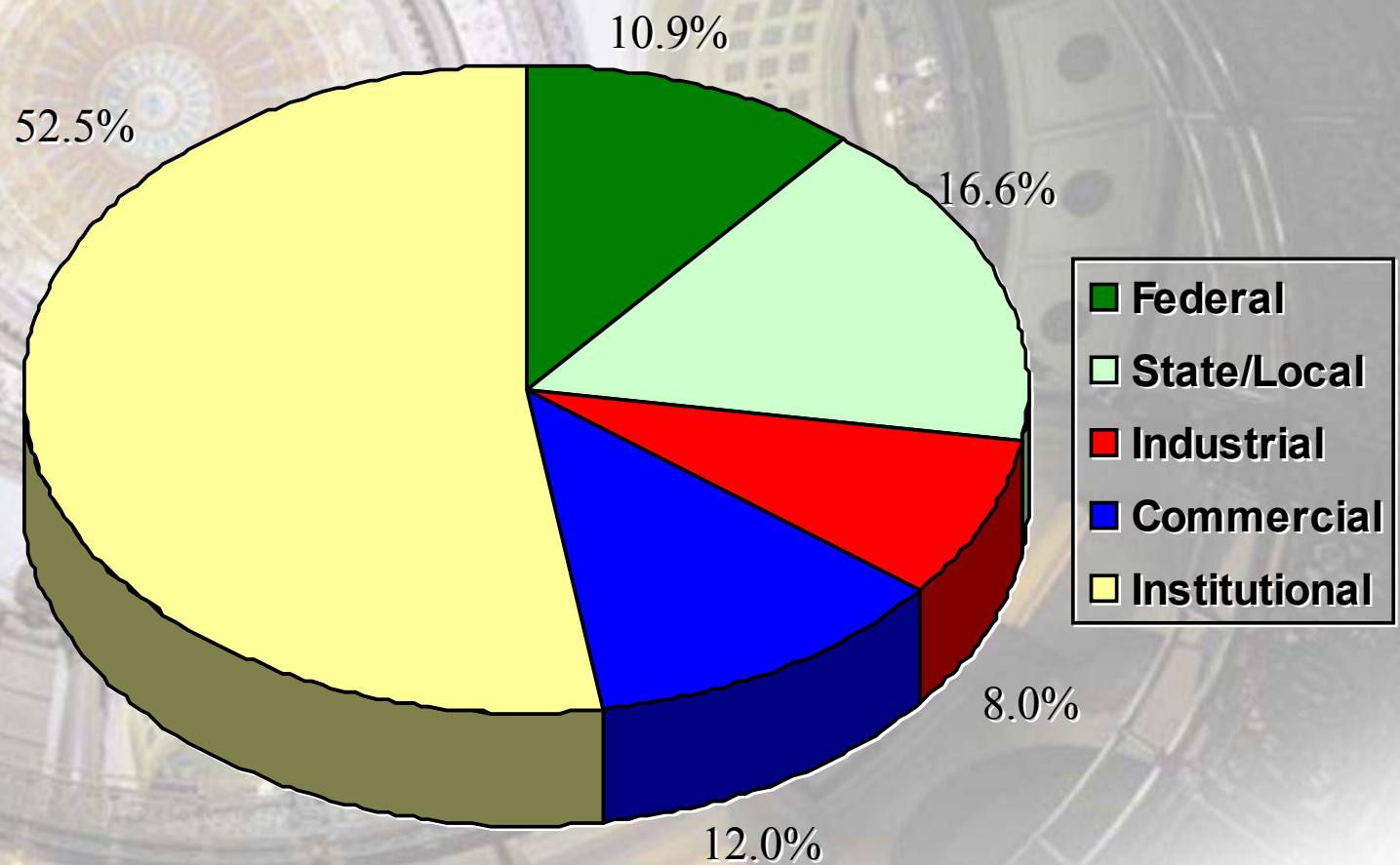
Before Improvements



After Improvements



The PC Marketplace



Important Features of a Performance Contract

- A **single procurement process** with one contractor that is accountable for design, purchase, installation, maintenance and operation of equipment.
- Package includes **financing mechanisms**.
- Provider fees are contingent upon actual level of **cost avoidance revenue** achieved.
- PC Program is supported by **utility bill savings, decreased maintenance activities, and capital cost avoidance funding** that pays for the improvements.





The PC Process

- Identify and evaluate energy-saving opportunities
- Conduct feasibility analyses
- Develop engineering designs and specifications
- Guarantee that savings will cover all project costs
- Structure a paid-from-savings program
- Arrange for financing
- Handle purchase and installation of equipment
- Manage the project from design to beneficial use and system monitoring
- Train staff and provide ongoing maintenance services
- Conduct administrative services

Canyon County ESPC



- **\$1.4 million in upgrades to 7 buildings, including: Courthouse, Jail Annex, Dale Haile Detention Facility**
- **Upgrades to building automation system, cooling towers, lighting, replacing outdated equipment**
- **Reducing energy costs by \$120,000 to annual budget of \$300,000**

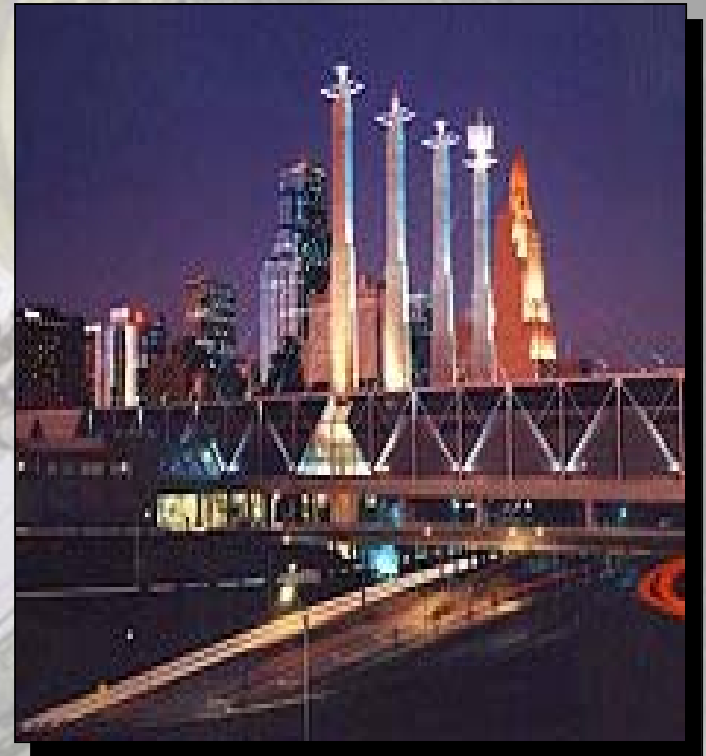
State of Maryland ESPC

- Governor's Executive Orders
- All state-run buildings
- \$29 million in savings 1994 to 2010
- Saving 339,00 MW hours and reducing CO₂ by 650,000 tons
- Full scope of PC services
- LEED Silver Level

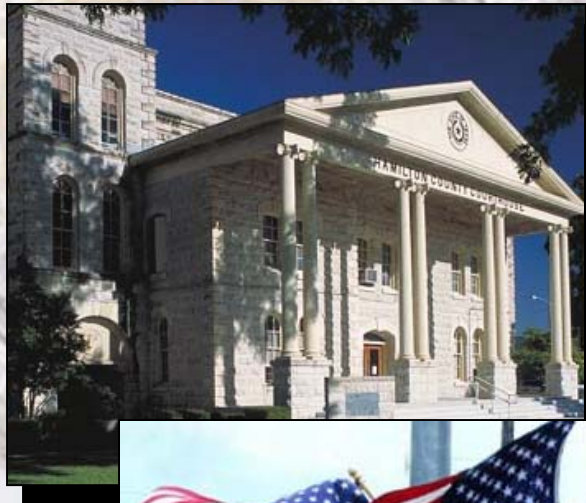


Kansas City Convention Center

- 1.6 million sq ft
- \$8.4 million PC
- Upgrades to HVAC, plumbing, lighting
- New building automation system
- Two on-site engineers
- \$1.1 million in annual savings



Water Conservation in Hamilton & Crowley, TX



- Replace outdated water meters, add automated meter reading
- Gray water reclamation
- Begun in 1999
- Numerous buildings completed in Cities of Hamilton & Crowley
- Overall 14% reduction in water use
- Revenue loss prevention



The Next Level for Performance Contracting

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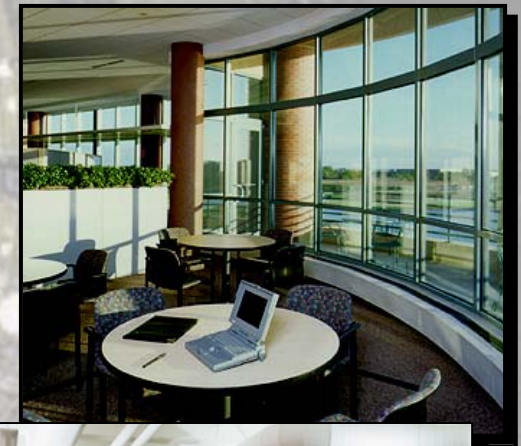
“High Performance” Performance Contracting

- **High Performance Green Buildings**
 - Builds off of energy efficiency
 - Goes to other building utilities and resources
 - Takes a total building, integrated approach
 - Emphasis on indoor environmental quality and impact on natural environment
 - Extends economic measures to total building



Characteristics of High Performance Green Buildings

- Optimal energy, environmental and economic performance
- Increased efficiencies saving energy and resources
- Satisfying, productive, quality indoor spaces
- Whole-building design, construction and operation over entire life cycle
- Fully integrated approach – teams, processes, systems





The U.S. Green Building Council



- A national coalition representing all sectors of the building industry (nearly 3,000 members)
 - Architects
 - Engineers
 - Product Mfrs
 - Building Owners
 - Environmental Groups
 - Utilities
 - Universities
 - Federal, State, Local Government
- Promotes the design, construction and operation of environmentally responsible, profitable, healthy places to live and work
- Launched LEED (Leadership in Energy & Environmental Design) in 2000 (700+ projects)
- Piloting LEED for Existing Buildings 2002 / 03



LEED Programs

- **Building Certification – LEED Certified, Silver, Gold, Platinum**
- **Professional Accreditation**
- **Training Workshops**
- **Educational Resources**
- **Web Site – www.usgbc.org**



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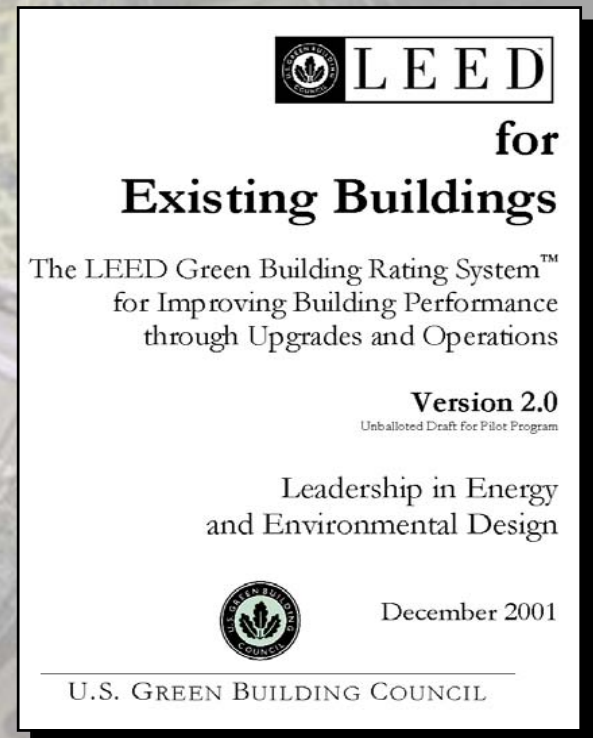
LEED Rating System

- Self-assessing system to guide project development
- 4 levels of certification
 - LEED Certified 26 - 32 points
 - Silver Level 33 - 38 points
 - Gold Level 39 - 51 points
 - Platinum Level 52 + points



Launch of LEED EB

- Two drafts with input of an Expert Advisory Group of 167 people representing 119 organizations / companies in all sectors of building industry
- Pilot Program Launched Jan. 2002 – 70+ participants
- Balloted LEED EB rating system to be launched in March 2003





LEED EB Pilot Participants

- **National Geographic Society Headquarters**
- **Pentagon**
- **State of Maryland**
- **Kansas City, MO**
- **Furman University**
- **US Department of the Interior**
- **Buffalo Public Schools**
- **Case Western Reserve University**
- **Microsoft**
- **Johnson & Johnson**
- **Liberty Property Trust**
- **University of Cincinnati**
- **Russellville, AR School District**
- **General Services Administration**
- **Jackson County, MO**
- **Emory University**



Categories

Sustainable Sites (22%)

Materials & Resources (20%)

Water Efficiency (8%)

Energy & Atmosphere (27%)

Indoor Environmental Quality (23%)

Sustainable Sites



Prerequisite

Erosion & Sedimentation
Control

Credits

Site Selection

Urban Redevelopment

Brownfield Redevelopment

Alternative Transportation

Reduced Site Disturbance

Storm Water Management

Reduction of Heat Islands

Light Pollution Reduction

Green Site & Building Exterior
Management (EB)

Materials & Resources

Prerequisite

- **Storage & Collection of Recyclables**
(Waste Management in EB)

Credits

- **Building Reuse**
- **Construction Waste Management**
- **Resource Reuse**
- **Recycled Content**
- **Local/Regional Materials**
- **Rapidly Renewable Materials**
- **Certified Wood**
- **Occupant Recycling (EB)**



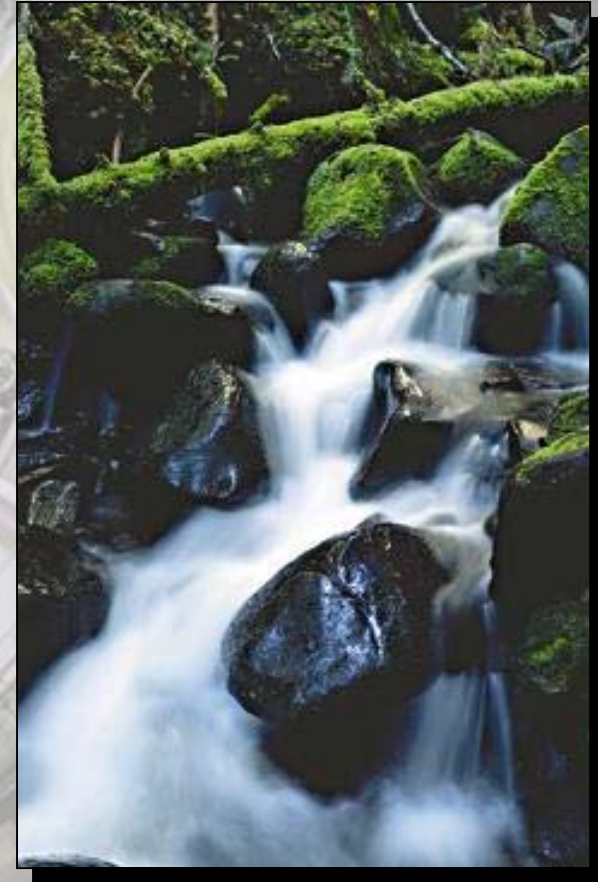
Water Efficiency

Prerequisites

- Minimum Water Efficiency (EB)
- Discharge compliance (EB)

Credits

- Water Efficient Landscaping
- Innovative Wastewater Technologies
- Water Use Reduction



Energy & Atmosphere

Prerequisites
Building Commissioning
Minimum Energy Performance
(EB Adds EPA ENERGY STAR standards)
Ozone Protection (EB)

Credits
Optimize Energy Performance
Renewable Energy
Additional Commissioning
Additional Ozone Protection
Measurement & Verification
Green Power





Indoor Environmental Quality

Prerequisites

- Minimum IAQ Performance
- Environmental Tobacco Smoke Control
- Asbestos removal/encapsulation (EB)

Credits

- Carbon Dioxide Monitoring
- Increased Ventilation Effectiveness
- Construction IAQ Management
- Low-Emitting Materials
- Indoor Chemical/Pollutant Control (Green Housekeeping EB)
- Controllability of Systems
- Thermal Comfort
- Daylighting / Views
- Contemporary IAQ Practice (EB)





Government LEED Projects

- **49 of 700+ (7%) LEED NB Registered Projects**
 - 19 California
 - 9 Southwest
 - 8 East Coast
 - 6 Midwest
 - 4 Mountain States
 - 2 South
 - 1 Canada
- **24 of 74 (32%) LEED EB Registered Pilot Projects**



LEED EB Case Study

- **Kansas City, City Hall**

- 29-story, 440,000 sq. ft. building
- Art deco built in 1936
- Green auditing stage
- In LEED EB pilot program
- Currently conducting a \$5.4 million PC project to retrofit lighting, plumbing, HVAC, controls
- Realized savings of \$71,000 in installation phase – now measuring 1 year savings



LEED NC Case Study

- **PA DEP Cambria Office**

- 34,500 sq ft
- Cost \$90 / sq ft
- Energy cost is 66% lower than base building cost
- Reduces water consumption by 32.6%
- 88% of occupied spaces have 2% or > daylighting with 100% access to exterior view





Economic Benefits of Green Design

- **Lower Construction Costs**
 - Reduced site preparation & landscaping
 - Lower waste disposal costs by 50% to 98%
- **Reduced Operating Costs**
 - Lower utility costs by 20% to 50%
 - Up to a 25% reduction in life cycle costs
- **More Productive Environment**
 - Better tenant & worker attraction/retention
 - Less absenteeism by 45%
 - Higher productivity up to 16%



Economic Benefits of Green Design

- **Higher Valuation of Building**
 - Up to \$4 increased valuation for every \$1 spent
- **Higher Visibility & Marketability**
- **Reduced Insurance & Risk of Liability**
 - Healthier indoor environment
 - Greater occupant satisfaction
 - Lower natural environmental impacts
 - Streamlined regulatory approvals



State and Local Sustainable Efforts

- Green buildings in context of **sustainable development** (Smart Growth, energy policy, etc.)
- **Legislation** for sustainability & energy efficiency
- **Executive orders** from elected officials
- **Revised building codes** include green principles
- **Offices** of Sustainability and Environment
- **Public benefit charges** are an emerging trend
- **Tax incentives** for building green
- **Sustainable language** in project proposals / RFPs
- Growing adoption of **LEED** Rating System



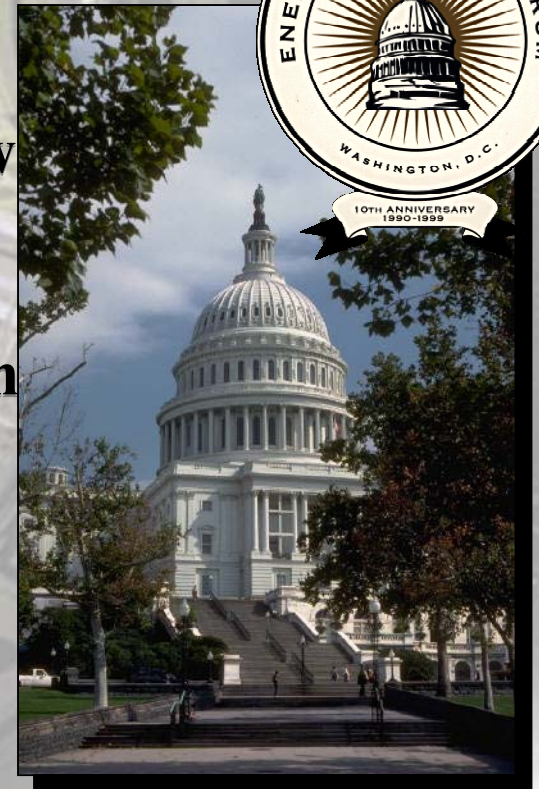
Value Proposition of Green

- **Good fiscal management**
 - Cost savings save taxpayer dollars
- **Excellent quality of life**
 - Quality building environments
- **Potential for economic development**
 - New markets for green technologies
- **Sound environmental stewardship**
 - Waste and treatment cost reduction
 - Reduced air and water pollution
 - Energy efficiency and renewable use

Initiatives on Energy and the Environment

Energy Efficiency Forum

- 400 industry executives, government officials and new media
- National dialog on energy, economy and the environment held in Washington, D.C.
- 14th Forum in June 2003
- Sponsored by the USEA and Johnson Controls



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Initiatives on Energy and the Environment



ENERGY STAR®

- Voluntary program sponsored by U.S. EPA
- Participants agree to implement energy-efficient technologies to earn ENERGY STAR Label
- They receive national and local recognition



Rebuild America

- A voluntary program of the U.S.DOE
- Engages diverse groups in developing energy savings initiatives
- Promotes performance contracting to local and state governments and other groups



Energy Services Coalition

- Promotes energy savings PC contracts
- Links building owners/operators with ESCOs
- 29 States Energy Offices represented
- Rebuild America Strategic Partner